

IN THE CLAIMS:

The status of all claims in this reissue application is indicted below. Cancelled original patent claims 2-5 and 7 are set forth below in bracketing.

Please AMEND claims 30 and 34 of this REISSUE Application in accordance with the following:

1. (PREVIOUSLY PRESENTED) A band-pass filter having a pair of band-pass filter [input] common signal terminals and plural pairs of band-pass filter [output] signal terminals, comprising:

a pair of SAW filters having respective pass bands and comprising a plurality of one-port SAW resonators connected in a multiple ladder structure, each having at least a first stage located at a side of the pair of band-pass filter [input] common signal terminals and a series-arm resonator located at the first stage, a pair of input terminals and a pair of output terminals;

the pair of band-pass filter [input] common signal terminals being commonly connected to the [respective pairs of input terminals of the pair] pair of SAW filters;

the plurality of pairs of band-pass filter [output] signal terminals being respectively connected to the [respective pairs of output terminals of the pair] pair of SAW filters; and

an inductance element located between at least one of the SAW filters located at the first stage and the pair of band-pass filter [input] common signal terminals and directly connected between the [respective pair of input] common signal terminals [of the at least one of the SAW filters] and thereby in parallel to said at least one of the SAW filters.

[2. A SAW filter comprising:

a plurality of first SAW resonators, each having a pair of terminals and a predetermined resonance frequency (f_p), said first SAW resonators being connected in respective, parallel arms of the SAW filter;

a plurality of second SAW resonators, each having a pair of terminals and a predetermined resonance frequency (f_s) approximately equal to an antiresonance frequency (f_{ap}) of each of the first SAW resonators, said

second SAW resonators being provided in series arms of the SAW filter; and

inductance elements respectively connected in series with the first SAW resonators in the parallel arms and formed of wires.]

[3. The SAW filter as claimed in claim 2, further comprising:
a package accommodating the first and second resonators and the inductance elements; and lead terminals extending from interiorly of the package to exteriorly thereof,
said wires of the inductance elements being bonded to said lead terminals.]

[4. A band-pass filter having a predetermined pass-band characteristic and comprising:
a plurality of SAW resonators connected in a ladder formation, said plurality of resonators being connected in respective serial arms and parallel arms; and bonding inductance elements, said parallel arms of said ladder formation being connected to ground via respective said bonding inductance elements.]

[5. The band-pass filter as claimed in claim 4, wherein said bonding inductance elements comprise wires.]

6. (PREVIOUSLY PRESENTED) A band-pass filter having a pair of band-pass filter [input] common signal terminals and plural pairs of band-pass filter [output] signal terminals, comprising:

[a pair of SAW filters having respective, different pass bands and each SAW filter having a pair of SAW filter input terminals and a pair of SAW filter output terminals and comprising a plurality of one-port SAW resonators connected in a ladder structure between the input and output terminals and including at least a first stage having a series-arm SAW resonator connected to one of the pair of input terminals;]

a pair of SAW filters having respective pass bands and comprising a plurality of one-port SAW resonators connected in a multiple ladder structure, each having at least a first stage located at a side of the pair of band-pass filter [input] common signal terminals and a series-arm resonator located at the first stage, a pair of input terminals and a pair of output terminals;

the pair of band-pass filter [input] common signal terminals being commonly connected to the [respective pairs of input terminals of the pair] pair of SAW filters;

the plurality of pairs of band-pass filter [output] signal terminals being respectively connected to the [respective pairs of output terminals of the] pair of SAW filters.

[7. A band-pass filter having a predetermined pass-band characteristic and comprising:
a plurality of SAW resonators connected in a ladder configuration of respective serial arms and parallel arms, said plurality of SAW resonators being connected in respective said serial arms and parallel arms; and
bonding inductance elements respectively connecting said parallel arms of said ladder configuration to ground.]

8-21 (CANCELLED)

22. (PREVIOUSLY PRESENTED) A SAW filter comprising:
a first SAW resonator having a pair of terminals and a predetermined resonance frequency (frp), said first SAW resonator being provided in a parallel arm of the SAW filter on a LiTaO₃ substrate; and
a second SAW resonator having a pair of terminals and a predetermined resonance frequency (frs) approximately equal to a predetermined antiresonance frequency of the first SAW resonator (fap), said second SAW resonator being provided in a series arm of the SAW filter on the LiTaO₃ substrate; and
an inductance element connected in series with the first SAW resonator in the parallel arm, the inductance element functioning to increase the admittance of the parallel arm and decrease the resonance frequency, wherein
the first SAW resonator comprises an exciting interdigital electrode and first and second reflectors, each of which comprises either aluminum or an aluminum alloy containing a few weight percentage of metal, other than aluminum; and
the respective film thicknesses of the exciting interdigital electrode and the first and second reflectors are in a range of from 0.06 to 0.09 times the period of the exciting interdigital electrode.

23. (PREVIOUSLY PRESENTED) A SAW filter comprising:
a first SAW resonator having a pair of terminals and a predetermined resonance frequency (frp), said first SAW resonator being provided in a parallel arm of the SAW filter on a LiTaO₃ substrate; and
a second SAW resonator having a pair of terminals and a predetermined resonance

frequency (frs) approximately equal to a predetermined antiresonance frequency of the first SAW resonator (fap), said second SAW resonator being provided in a series arm of the SAW filter on the LiTaO₃ substrate; and

an inductance element connected in series with the first SAW resonator in the parallel arm, the inductance element functioning to increase the admittance of the parallel arm and decrease the resonance frequency, wherein

the first SAW resonator comprises an exciting interdigital electrode and first and second reflectors, each of which comprises either gold or a gold alloy containing a few weight percentage of metal other than gold; and the respective film thicknesses of the exciting interdigital electrode and the first and second reflectors are in a range of from 0.0086 to 0.013 times the period of the exciting interdigital electrode.

24. (PREVIOUSLY PRESENTED) A SAW filter comprising:

a plurality of first SAW resonators on a single piezoelectric substrate, each having a pair of terminals and a predetermined resonance frequency (frp), said first SAW resonators being connected in respective, parallel arms of the SAW filter;

a plurality of second SAW resonators on the piezoelectric substrate, each having a pair of terminals and a predetermined resonance frequency (frs) approximately equal to the predetermined antiresonance frequency of the first SAW resonator (fap), said second SAW resonators being provided in a series arm of the SAW filter; and

inductance elements respectively connected in series with the first SAW resonators in the parallel arms.

25. (PREVIOUSLY PRESENTED) A band-pass filter having a pair of band-pass filter common signal terminals and plural pairs of band-pass filter signal terminals, comprising:

a first SAW filter having a pass band, having a band center frequency and comprising a plurality of one-port SAW resonators connected in a multiple ladder structure, having at least a first stage located at a side of the pair of band-pass filter common signal terminals and a series-arm resonator located at the first stage, a pair of input terminals and a pair of output terminals;

a second SAW filter having different pass band from the pass band of the first SAW filter, having a band center frequency which is larger than the band center frequency of the first SAW filter and comprising a plurality of one-port SAW resonators connected in a multiple ladder structure, having at least a first stage located at a side of the pair of band-pass filter common

signal terminals and a series-arm resonator located at the first stage, a pair of input terminals and a pair of output terminals;

the pair of band-pass filter common signal terminals being commonly connected to the first and second SAW filters;

the plurality of pairs of band-pass filter signal terminals being respectively connected to the first and second SAW filters; and

an impedance matching circuit located between the first stage of the second SAW filter and the common signal terminals and thereby directly connected between the common signal terminals of the second SAW filter and in parallel to the second SAW filter.

26. (PREVIOUSLY PRESENTED) The band-pass filter as claimed in claim 25, wherein the impedance matching circuit includes an inductor.

27. (PREVIOUSLY PRESENTED) The band-pass filter as claimed in claim 26, wherein the inductor is formed with a metallic strip line.

28. (PREVIOUSLY PRESENTED) The band-pass filter as claimed in claim 27, wherein the metallic strip line is formed on a ceramic package.

29. (PREVIOUSLY PRESENTED) A band-pass filter comprising:
a first SAW filter having a pass band, having a band center frequency and comprising a plurality of one-port SAW resonators connected in a multiple ladder structure, having at least a first stage and a series-arm resonator located at the first stage, a pair of input terminals and a pair of output terminals;

a second SAW filter having a different pass band from the pass band of the first SAW filter, having a band center frequency which is larger than the band center frequency of the first SAW filter and comprising a plurality of one-port SAW resonators connected in a multiple ladder structure, having at least a first stage and a series-arm resonator located at the first stage, a pair of input terminals and a pair of output terminals;

a pair of band pass filter common signal terminals commonly connected to the first and second SAW filters;

a plurality of pairs of band pass filter signal terminals respectively connected to the first and second SAW filters;

an inductance element, located between the first stage of the second SAW filter and the common signal terminals and thereby directly connected between the common signal terminals and in parallel to the second SAW filter; and

a capacitance element connected in series between said inductance element and said series-arm resonator of the first stage of the second SAW filter.

30. (CURRENTLY AMENDED) A band-pass filter comprising:

a first band-pass filter having a pass band, having a band center frequency and comprising a plurality of one-port acoustic wave resonators connected in a multiple ladder structure, having at least a first stage and a series-arm resonator located at the first stage, a pair of input terminals and a pair of output terminals;

a second band-pass filter having a different pass band from the pass band of the first band-pass filter, having a band center frequency which is larger than the band center frequency of the first band-pass filter and comprising a plurality of one-port acoustic wave resonators connected in a multiple ladder structure, having at least a first stage and a parallel-arm resonator located at the first stage, a pair of input terminals and a pair of output terminals;

a pair of band-pass filter common signal terminals commonly connected to the first and second band-pass filters;

a plurality of pairs of band-pass filter signal terminals respectively connected to the first and second band-pass filters;

a circuit element used for phase rotation and connected in series between one of the pair of common signal terminals and the second band-pass filter.

31. (PREVIOUSLY PRESENTED) The band-pass filter as claimed in claim 30, wherein the line is formed on a glass-epoxy substrate or a ceramic substrate.

32. (PREVIOUSLY PRESENTED) The band-pass filter as claimed in claim 30, further comprising an inductance element located between the second SAW filter and the common signal terminals of the second SAW filter.

33. (PREVIOUSLY PRESENTED) The band-pass filter as claimed in claim 32, further comprising a capacitance element connected in series between the inductance element and the first stage of the second SAW filter.

34. (CURRENTLY AMENDED) A band-pass filter having a pair of band-pass filter common signal terminals and plural pairs of band-pass filter signal terminals, comprising:

a pair of SAW filters, each having respective pass bands, a pair of input terminals, a pair of output terminals and at least one of the pair of SAW filters comprising only a plurality of SAW resonators connected in a multiple ladder structure formed by series arms and parallel arms on a single piezoelectric substrate;

the pair of band-pass filter common signal terminals being commonly connected to the pair of SAW filters; and

the plurality of pairs of band-pass filter signal terminals being respectively connected to the pair of SAW filters.

35. (PREVIOUSLY PRESENTED) A band-pass filter having a predetermined pass-band characteristic and comprising:

a plurality of SAW resonators connected in a ladder formation, said plurality of resonators being connected in respective serial arms and parallel arms; and

bonding inductance elements, said parallel arms of said ladder formation being connected to ground via respective said bonding inductance elements, wherein:

a package in which the band-pass filter is mounted, contains a piezoelectric substrate and the ground; and

the plurality of SAW resonators are on the piezoelectric substrate.

36. (PREVIOUSLY PRESENTED) A band-pass filter having a predetermined pass-band characteristic and comprising:

a plurality of SAW resonators connected in a ladder formation, said plurality of resonators being connected in respective serial arms and parallel arms; and

bonding inductance elements, said parallel arms of said ladder formation being connected to ground via respective said bonding inductance elements, wherein:

a package in which the band-pass filter is mounted contains a piezoelectric substrate;

the plurality of SAW resonators are on the piezoelectric substrate; and

a first electric resistance (R_s) of an interdigital electrode of a SAW resonator provided in a series arm, is smaller than a second electric resistance (R_p) of an interdigital electrode of a SAW resonator provided in a parallel arm which is next to the series arm.

37. (PREVIOUSLY PRESENTED) A band-pass filter having a predetermined pass-band characteristic and comprising:

a plurality of SAW resonators connected in a ladder formation, said plurality of resonators being connected in respective serial arms and parallel arms; and

bonding inductance elements, said parallel arms of said ladder formation being connected to ground via respective said bonding inductance elements, wherein:

the plurality of SAW resonators are on a piezoelectric substrate; and

the bonding inductance elements are respectively connected to the ground outside the piezoelectric substrate.